

Technical Attachment

Interagency Teamwork for Upper Atmosphere Research

Jeffrey Cupo
NWS Forecast Office, Midland, Texas

The Johnson Space Center in Houston is home to NASA's High Altitude Research Program. As part of that program, two WB-57 aircraft, based at nearby Ellington Field, have been flying high altitude atmospheric research missions since the early 1960s. In November 2004, in conjunction with NOAA's Aeronomy Laboratory in Boulder, Colorado, one of the WB-57s took part in a special mission in West Texas. The purpose was to calibrate instruments on the aircraft for future missions involving atmospheric sampling of ozone and other gases and chemical compounds. WFO Midland staff assisted with that project.

One might consider West Texas to be a strange place to be conducting high altitude experiments, but NOAA/ARL scientists Holger Voemel, Thomas Thompson and Richard Winkler chose the Midland/Odessa area specifically because of its normally dry, benign weather in the fall. Unfortunately, an abnormally wet season this year slightly delayed the project. In fact, for much of Texas it was the wettest November on record! Five consecutive days of rain from November 13-17 forced the researchers to wait. On November 15, Midland recorded 1.55 in – a record one-day amount for November. (By mid-December Midland had received 22.41 in of rain, 7.98 in above the annual average.)

When the weather finally allowed, members of the WFO electronics and upper air staff teamed with the ARL researchers to conduct a special balloon flight related to water frost point experiments and calibration of the WB-57 aircraft systems. The research balloon and train launched on November 18 was significantly different from the usual RAOB and its 600 gram balloon. The research flight used a 1500 gram balloon requiring nearly 6000 cubic ft of hydrogen. The instrument package weighed nearly 25 pounds. The balloon, once inflated, was about 20 ft tall and 15 ft in diameter. The parachute had a diameter of 6 ft.

Following the launch, the WB-57 met and tracked the balloon to 61,000 ft. The balloon flew to 92,000 ft before it burst. A GPS sensor onboard the instrument package provided positioning information, along with the pressure altimeter readings. After descent, the package was recovered about 150 ft from the road, just west of San Angelo (about 100 miles from the launch site). Comparisons were made between the aircraft and balloon instruments and the flight was deemed a success.

WFO Midland DAPM Eddie Brite assisted with logistical procedures, ESA Wayne Patterson assisted with electronics and set up, and HMTs Mike Young and Susan Griffin assisted with the balloon launch. The entire NWS Midland/Odessa provided overall support for supporting this critical inter-agency mission.

More information about the JSC/NASA High Altitude Research Program, its history and aircraft, can be found at <http://jsc-aircraft-ops.jsc.nasa.gov/wb57/index.html>.



Figure 1. Fully inflated balloon awaiting launch in the Midland/Odessa, TX WFO inflation building.



Figure 2. *NOAA/ARL researcher Holger Voemel prepares to release the radiosonde package, assisted by HMT Michael Young.*